Amrich Energy

2615 South Miller St., Ste. 107
Santa Maria, CA 93455

November 26, 2012

Mr. Ross Brunetti
California Division of Oil and Gas & Geothermal Resources
195 S. Broadway, Suite 101
Orcutt, CA 93455-4655

Subject: Casmalia Oil Field Injection Permit for Amrich Energy Bognuda #5 Well

Dear Mr. Ross Brunetti,

The purpose of this letter is to request an aquifer exemption for a large area of the oil saturation Monterey reservoir zone outside the shaded area in Volume II of the a California Division of Oil and Gas & Geothermal Resources (DOGGR) 1977 publication "CALIFORNIA OIL & GAS FIELDS (see attached map). We recognize that, while this directional well falls entirely within the Casmalia Oil Field Administrative Boundary, it does lie outside the DOGGR field boundary (the zone "shaded" gray on page showing the Casmalia Oil Field of the CADOGGR 1977 publication "CALIFORNIA OIL & GAS FIELDS Volume II"). Amrich Energy's intent is to illustrate that future water injection into the Monterey section of the Bognuda #5 will not harm any drinking water aquifers within or adjacent to the Casmalia Oil Field. Injection into the outlined area falls within the areal extent of the oil saturated Monterey penetrated by the Bognuda #5 and will not cause damage to any of the future sources of usable water.

In accordance with the MOA's with the SWRCB and the EPA, we address the following questions:

2. For an aquifer with a TDS level between 3,000 and 10,000 mg/l TDS that is not reasonably expected to supply a public water system, the applicant must submit:

a. *A declaration that the aquifer is not a current source of drinking water and that the aquifer will not reasonably be expected to supply a public water system. This declaration should be made by a local water agency.*
b. *Data on the depth and lateral extent of the aquifer and the location and depth of any drinking-water wells in the area. (The injection wells should be at least double the depth of the deepest well providing drinking water to qualify for an exemption).*
c. *Information relative to the aquifer, such as:*
    1. *The distance to existing towns.*
    2. *The ownership and types of land-use in the area.*
    3. *The availability of alternate water sources to the area (surface and groundwater)*
    4. *Any unusual geology.*
d. *The type of constituents and TDS in the formation fluid (preferably a water analysis).*
e. *The yield of water.*

2.a: There are no fresh water wells producing south of the northern CADOGGR administrative boundary of the Casmalia Oil Field. Local land owners (e.g., Mr. Roy Bognuda and Ms. Johanna Bradley) and farmers have reported that historically they cannot use the water from wells drilled from the northern edge of the Casmalia Oil Field to the south end of the town of Casmalia. All the water supplied to the town of Casmalia is piped in from the Santa Maria area via the Casmite pipeline.

We have requested a letter from the Regional Water Quality Control Board declaring that the aquifer is not expected to supply a public water system and will forward this to you if they provide the letter.

2.b: The aquifer in which the Bognuda #5 is drilled extends from the bottom hole location into the Casmalia Oil Field. This aquifer is essentially the same extent and geometry as the Monterey reservoir that produces oil from the Casmalia Oil Field (see attached map). We propose to inject water produced (as a by-product of our oil production) from our oil production wells on the Bognuda Lease (see attached map). This water will be injected into the Bognuda #5 into the same formation and production zone as it was pumped from in the offsetting Bognuda oil producers. This proposed injection zone extends vertically from -1,773' – 1,350' True Vertical Feet Subsea (TVDSS) which correlates with the 2,645 – 2,140 Measured Depth (MD) (see attached wellbore schematic). Current oil production from the Monterey reservoir produces at a 97% water cut. There are no wells in this area that produce drinking water.

2.c.1: The Bognuda #5 well is 5,700' from the town of Casmalia.

2.c.2: The area surrounding the Bognuda #5 ranges from an operating oil field to the north and east, farming to the west and south. To the northeast (3,400' away) is the Casmalia Dump which is an 252 acres EPA designated superfund site. Between 1973 and 1989 this site excepted over 5 billion pounds of hazardours materials, including pesticides, solvents, acids, metals, caustics, cyanide, and nonliquid polychlorinated biphenyls (PCBs). Link to a description of this site:

accepted

http://yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/ViewByEPAID/CAD020748125

Additionally, an abandoned water disposal well, the Wesco Morganti 1, exists less than 2,000 feet away, (wellbore diagram attached) which lies only 200 feet outside the "shaded" region of the DOGGR oil field map. In 1958, before the DOGGR's primacy agreement, DOGGR permitted this well as a water injection well, for Monterey injection, based on the premise that there are no fresh water-bearing formations at this location (see attached letter and wellbore diagram).

The land and minerals in this area are large land blocks owned by a few families that have been in the Casmalia area for decades.

2.c.3: As reported above, all the fresh water supplying the Casmalia area is piped in through the Casmite pipeline from nearby Santa Maria.

2.c.4: Geology in the area is characterized be a regional south dipping limb of an anticline which forms the trap for the Casmalia Oil Field. The stratigraphy consists of Pliocene sands, siltstones, diatomite, and

Miocene siliceous shale, cherts and dolomites. The more brittle Miocene lithologies are expected to be fractured.

2.d: Please find the Multi-Chem water analysis for Bognuda #5.

2.e: We estimate that 600 BWPD could be produced from the Monterey production zone from Bognuda #5. This water would be bad quality with a TDS of 4880 mg/L and would be produced from a deep zone (2500').

In closing, we sincerely appreciate the District's time and consideration of this Application for aquifer exemption that we hope to use for many wells in the future. Accordingly Amrich Energy would like to closely follow the progress of this aquifer exemption, so we hope that you let us know if you have any issues and then will let us know when it has been forwarded to Sacramento.

Sincerely,

Kim K. Wolfe, Regulatory Manager and Landman

Attachments:

(1) Bognuda #5 Water Analytical Results—TDS
(2) *Position of Bognuda #5 with Casmalia Field Boundary and "Shaded" area in 1977 CADOGGR Gold Book with topography map*
(3) *Position of Bognuda #5 with Casmalia Field Boundary and "Shaded" area in 1977 CADOGGR Gold Book with airphoto map*
(4) *Position of Bognuda 1, 2, 3, 4 and 5 wellbores map*
(5) *Map showing area requested for aquifer exemption*
(6) *Map showing area requested for aquifer exemption with Monterey Structure*
(7) Bognuda #5 Wellbore Diagram
(8) Wesco Morganti 1 injection request letter and wellbore diagram

Cc: John Harris
Amrich file

Multi-Chem Analytical Laboratory
19609 Broken CT
Shafter, CA 93263

multi-chem
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Units of Measurement: **Standard**

Water Analysis Report

Production Company:	**Amrich Energy (163)**	Sales Rep:	**James Brady**
Well Name:	**Bognuda 5**	Lab Tech:	**Jared Kimbrell**
Sample Point:	**Wellhead**		
Sample Date:	**8/26/2012**		
Sample ID:	**WA-222216**		

Scaling potential predicted using ScaleSoftPitzer from Brine Chemistry Consortium (Rice University)

Sample Specifics	
Test Date:	8/31/2012
System Temperature 1 (°F):	104.00
System Pressure 1 (psig):	15.0000
System Temperature 2 (°F):	104.00
System Pressure 2 (psig):	15.0000
Calculated Density (g/ml):	1.001
pH:	7.60
Calculated TDS (mg/L):	4879.53
CO2 in Gas (%):	
Dissolved CO_2 (mg/L)):	43.50
H_2S in Gas (%):	
H2S in Water (mg/L):	32.00

Notes:

Cations	*mg/L*	*Anions*	*mg/L*
Sodium (Na):	1592.81	Chloride (Cl):	2000.00
Potassium (K):	0.00	Sulfate (SO_4):	0.00
Magnesium (Mg):	48.00	Bicarbonate (HCO_3):	1185.00
Calcium (Ca):	48.00	Carbonate (CO_3):	
Strontium (Sr):	0.00	Acetic Acid (CH_3COO)	
Barium (Ba):	0.00	Propionic Acid (C_2H_5COO)	
Iron (Fe):	5.48	Butanoic Acid (C_3H_7COO)	
Zinc (Zn):	0.00	Isobutyric Acid ($(CH_3)_2CHCOO$)	
Lead (Pb):	0.00	Fluoride (F):	
Ammonia NH3:		Bromine (Br):	
Manganese (Mn):	0.25	Silica (SiO_2):	

(PTB = Pounds per Thousand Barrels)

		Calcium Carbonate		Barium Sulfate		Iron Sulfide		Iron Carbonate		Gypsum CaSO4·2H2O		Celestite SrSO4		Halite NaCl		Zinc Sulfide	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
104.00	15.00	0.90	35.43	0.00	0.00	3.88	3.02	1.91	3.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
104.00	15.00	0.90	35.43	0.00	0.00	3.88	3.02	1.91	3.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
104.00	15.00	0.90	35.43	0.00	0.00	3.88	3.02	1.91	3.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
104.00	15.00	0.90	35.43	0.00	0.00	3.88	3.02	1.91	3.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
104.00	15.00	0.90	35.43	0.00	0.00	3.88	3.02	1.91	3.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
104.00	15.00	0.90	35.43	0.00	0.00	3.88	3.02	1.91	3.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
104.00	15.00	0.90	35.43	0.00	0.00	3.88	3.02	1.91	3.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
104.00	15.00	0.90	35.43	0.00	0.00	3.88	3.02	1.91	3.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
104.00	15.00	0.90	35.43	0.00	0.00	3.88	3.02	1.91	3.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
104.00	15.00	0.90	35.43	0.00	0.00	3.88	3.02	1.91	3.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		Hemihydrate CaSO4~0.5H2O		Anhydrate CaSO4		Calcium Fluoride		Zinc Carbonate		Lead Sulfide		Mg Silicate		Ca Mg Silicate		Fe Silicate	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
104.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
104.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
104.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
104.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
104.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
104.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
104.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
104.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
104.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
104.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Multi-Chem Analytical Laboratory
19609 Broken CT
Shafter, CA 93263

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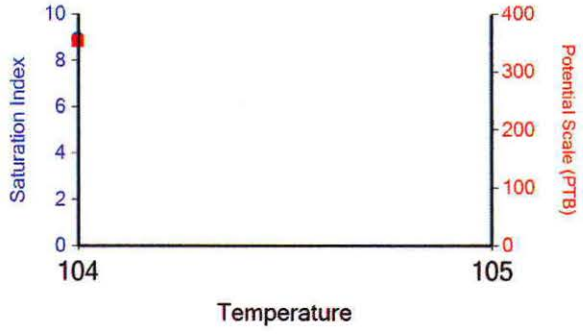
Water Analysis Report

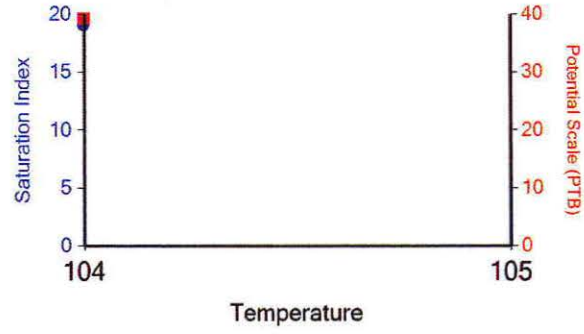
These scales have positive scaling potential under initial temperature and pressure: Calcium Carbonate Iron Sulfide Iron Carbonate

These scales have positive scaling potential under final temperature and pressure: Calcium Carbonate Iron Sulfide Iron Carbonate

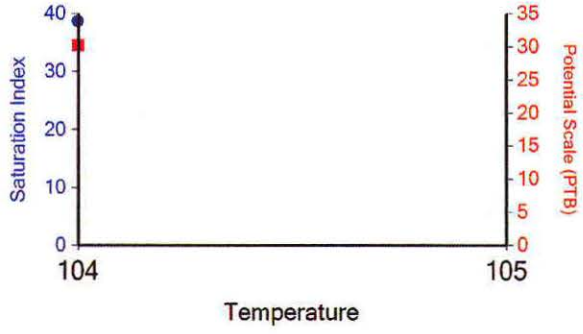
Calcium Carbonate

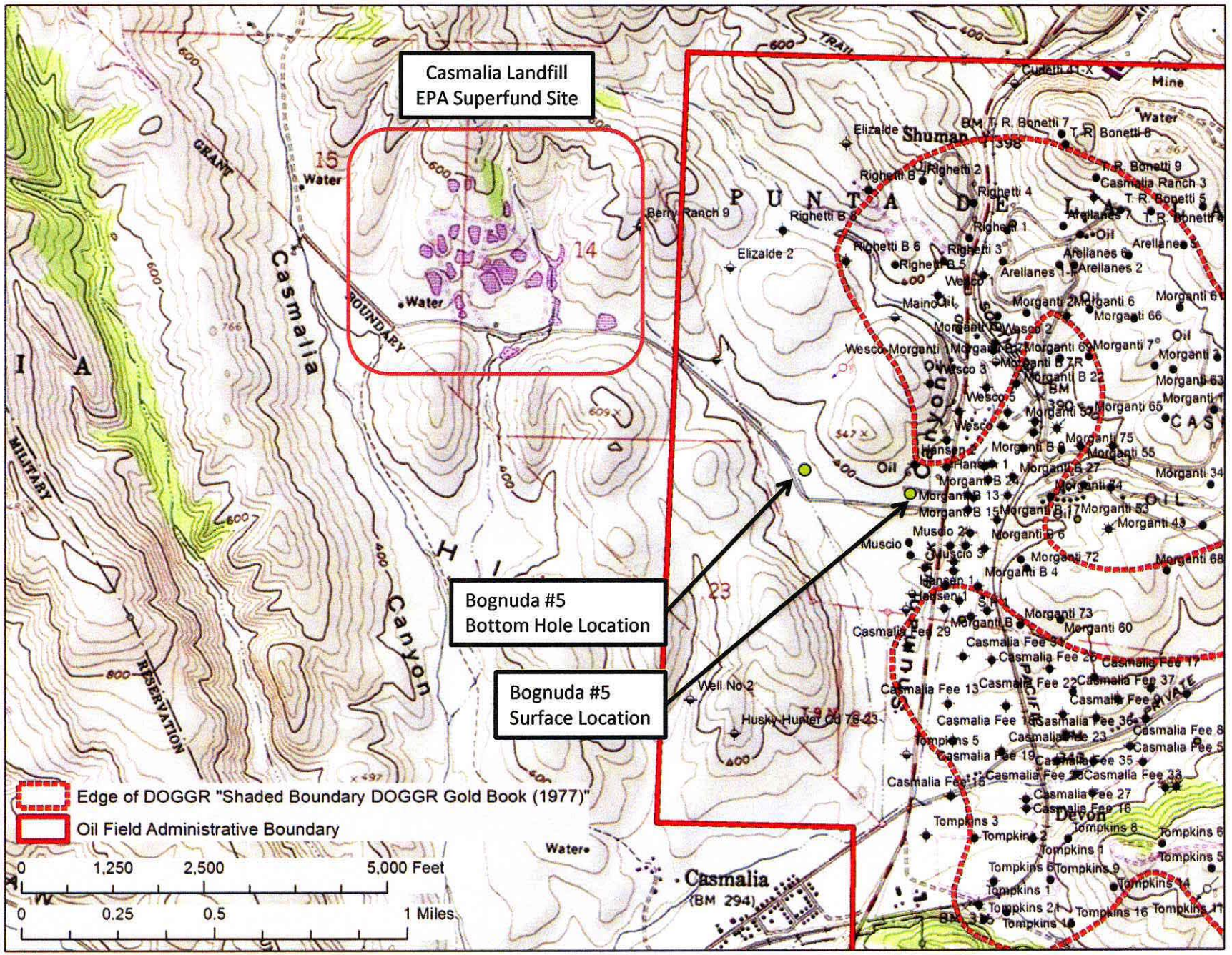


Iron Carbonate

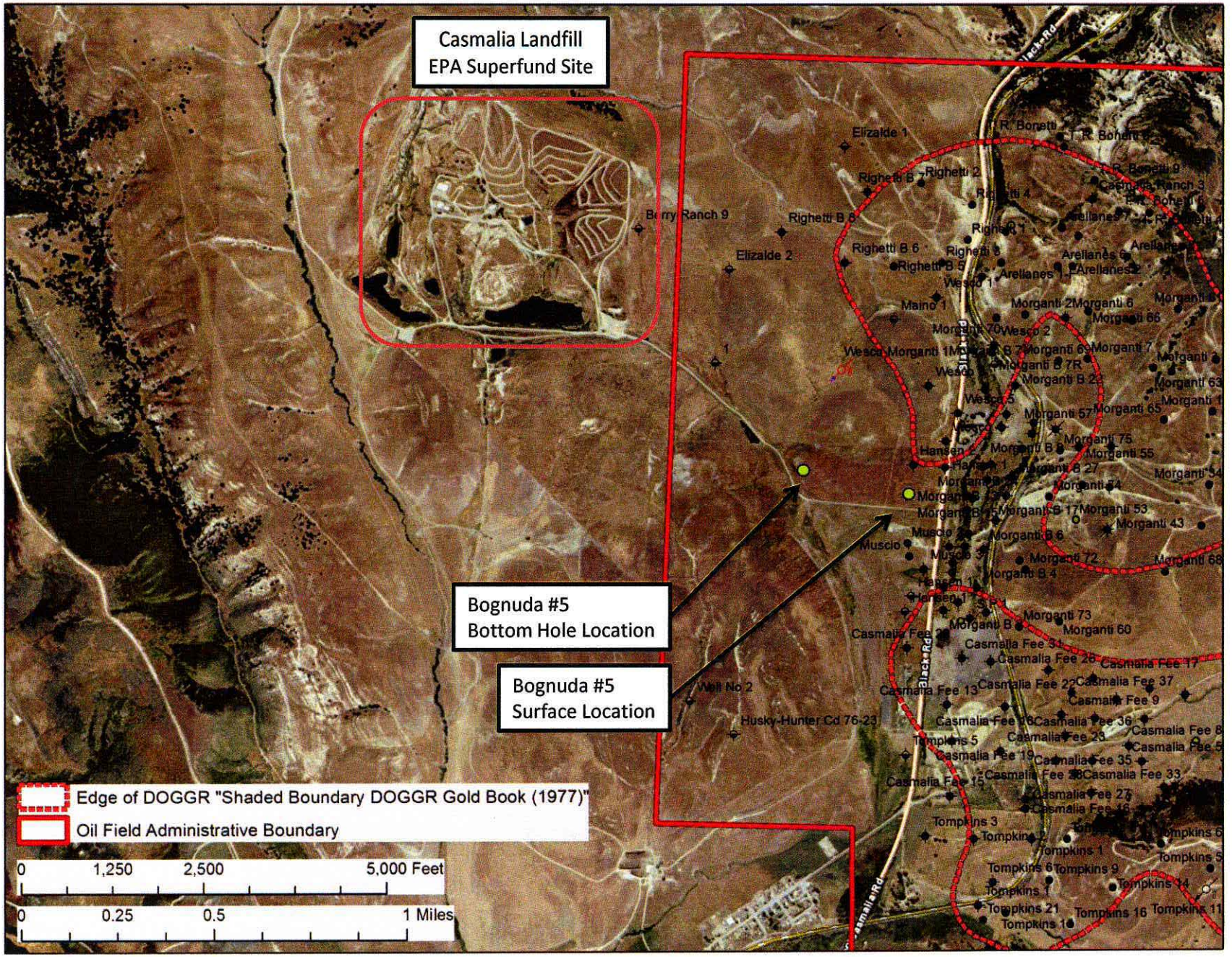


Iron Sulfide

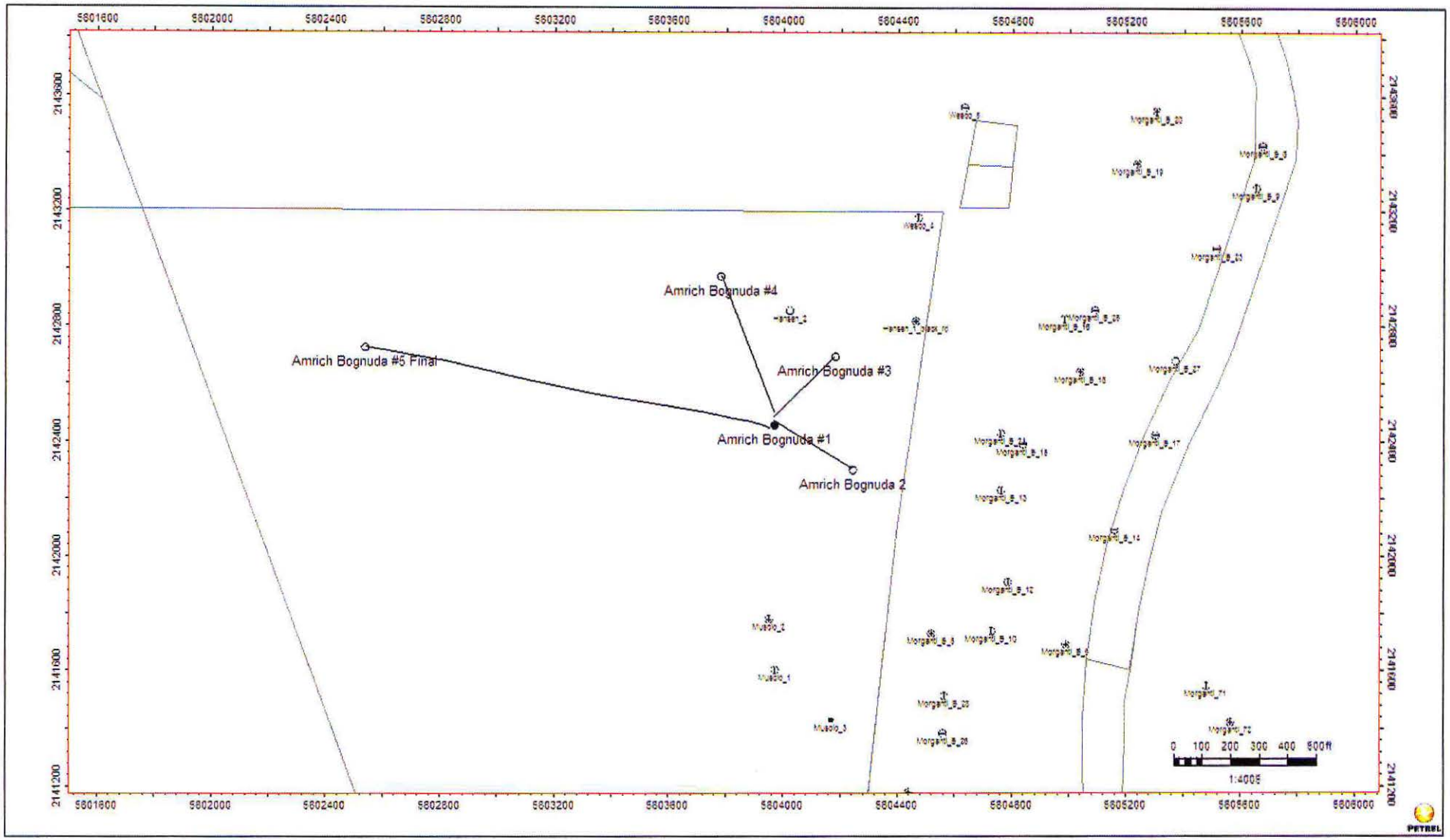




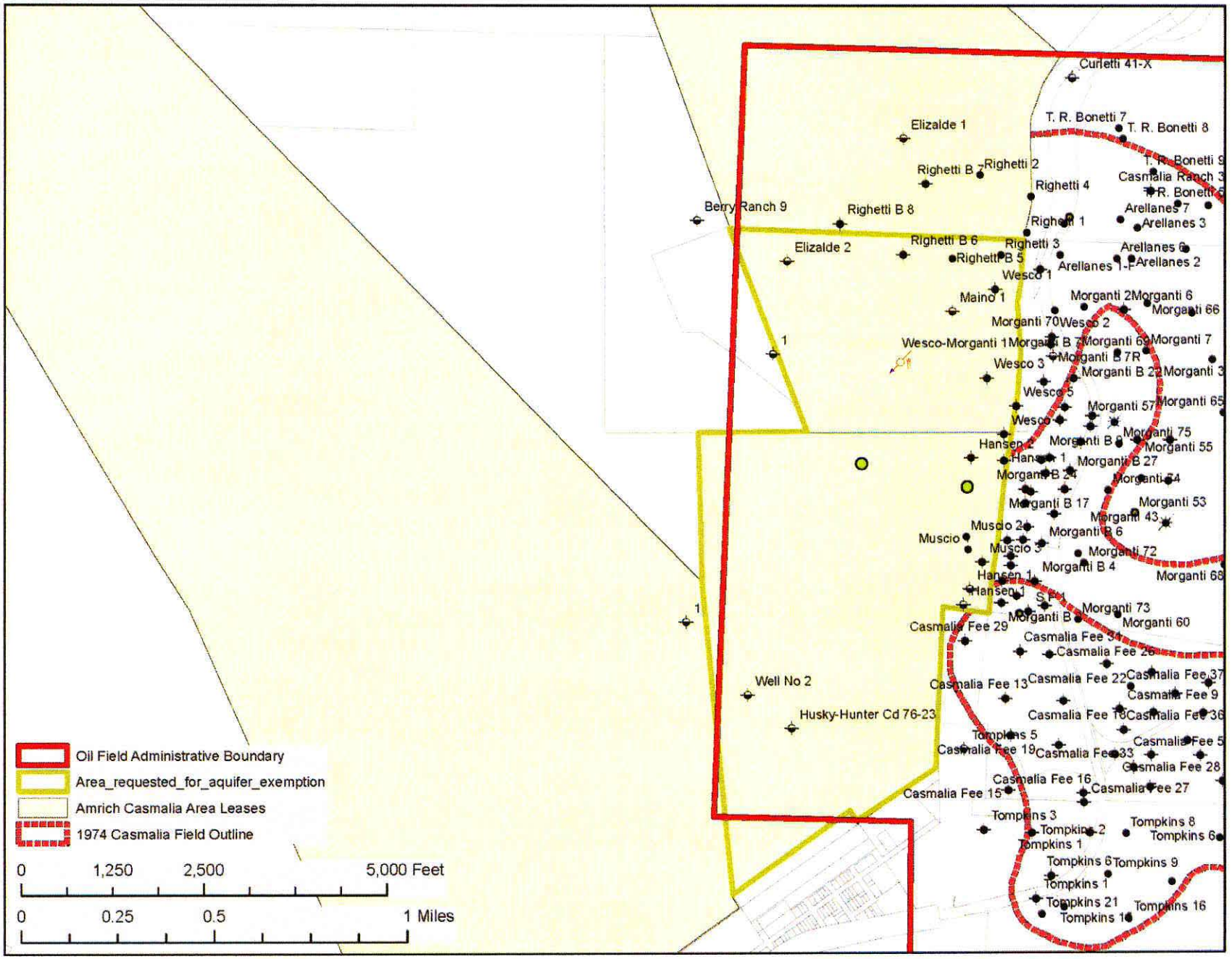
Position of Bognuda #5 with Casmalia Field Boundary and "Shaded" area in 1977 CADOGGR Gold Book with topography



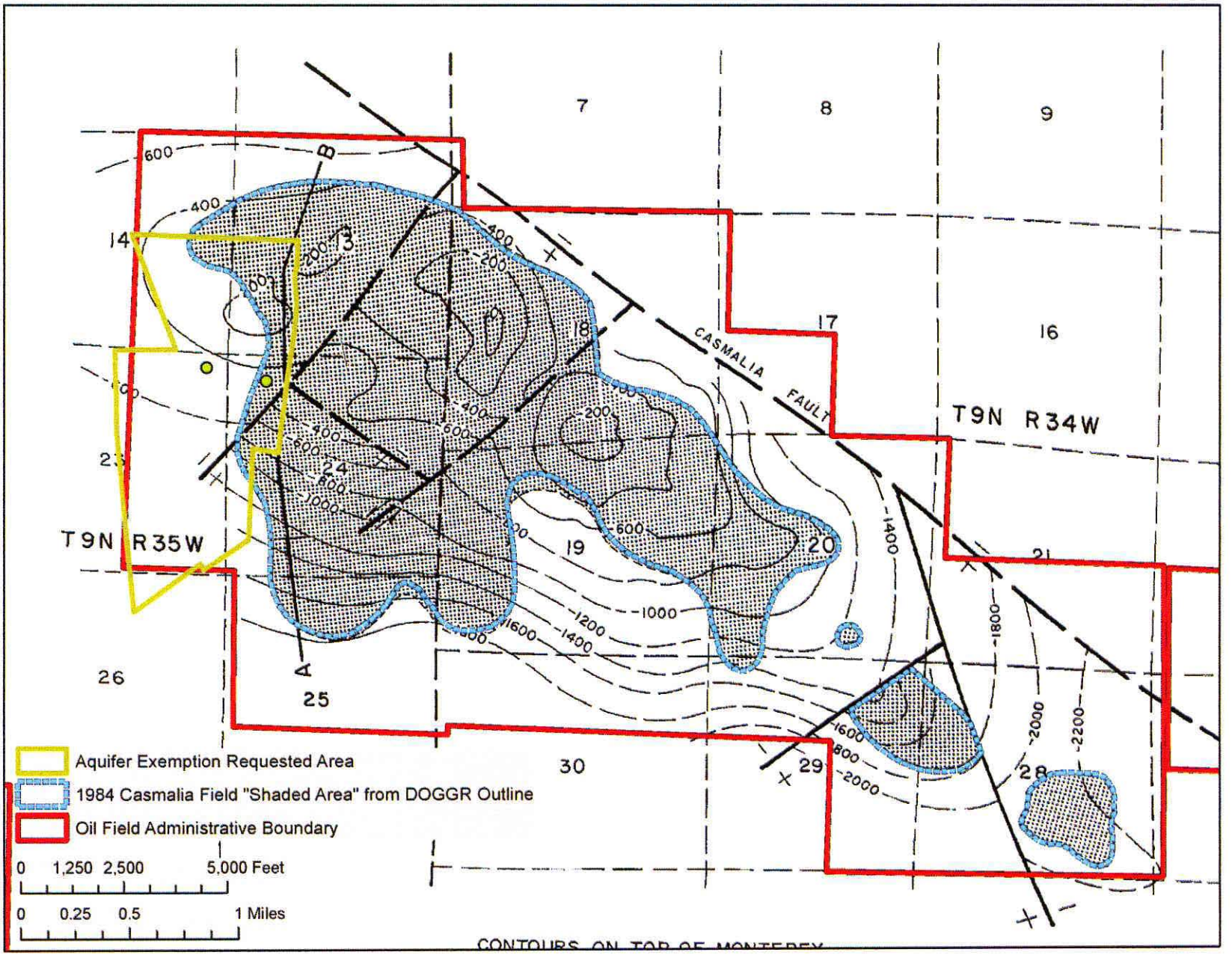
Position of Bognuda #5 with Casmalia Field Boundary and "Shaded" area in 1977 CADOGGR Gold Book with air photo



Position of Bognuda 1, 2, 3, 4 and 5 wellbores



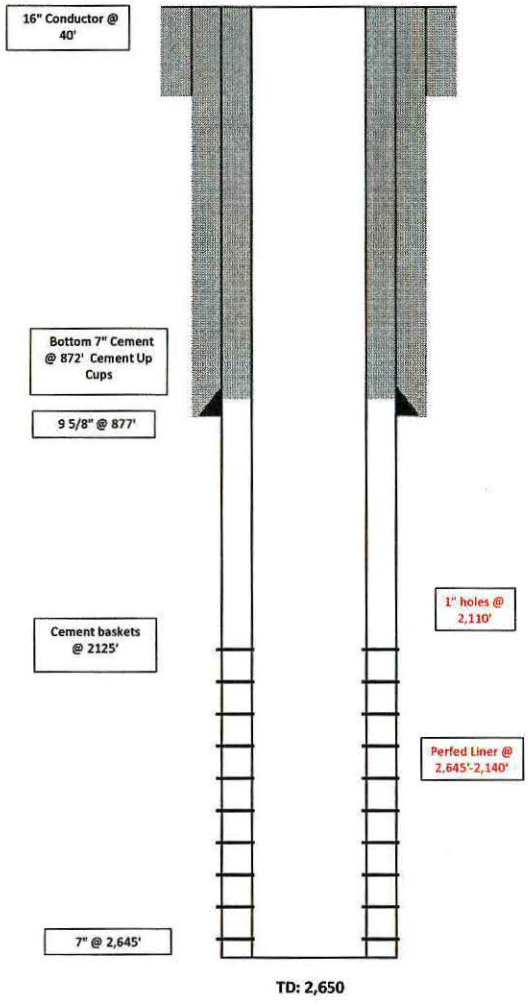
Area (in gold) requested for aquifer exemption



Area (in gold) requested for aquifer exemption with Monterey structure

Bognuda 5

Casmalia Field



OPERATOR:	mrich nerg
WELL:	ognuda
COUNTY:	Santa arbara
API # :	
FIELD:	Casmalia
DISTRICT:	
LEASE:	ognuda
LATITUDE:	
LONGITUDE:	
PRESENT STATUS:	ctive

Section	Township	Range	Meridian	Elev. GL	Elev. KB
			S		

Drilling and Completion Dates

Spud	rill T	e drill ate	e drill T	e rill

Casing

ole ia	Size(")	Weight (lbs/Ft)	Grade	Top (ft)	Bottom (ft)
	16			Surface	40
12 1/4	9 5/8	36#	J-55	Surface	877
8 3/4	7	23#	J-55	Surface	2,645

Cement Data

Hole Size	Number of Sacks or Cubic Feet of Cement	Comments
12 1/4	274 Cubic Feet	50/50 POZ, Returns to Surface
8 3/4	146 Cubic Feet	Returns to Surface

Perforations

Top of Perf	Bottom Depth	Date	Comments
2,110	2,110	7/26/2012	Perfed Liner, 1" Holes
2,140	2,645	7/26/2012	Perfed Liner, 4 1/2" Holes per Foot

Geological Markers

Formation	Measured Depth
Top Monterey	892
Buff and Brown	1,352
Chert Zone	1,806

Well Bore Diagram Created by Numeric Solutions LLC: 10/3/2012

Numeric Solutions LLC

July 24 1957

E H Musser

Santa Maria

I am enclosing three copies of report No. P 357-290 dated July 24, 1957, approving the proposal of Wesco Oil Company to convert well No. "Wesco-Morganti" 1, Sec. 14, T. 9 N., R. 35 W., S. B. B. & M., Casmalia field, to a water injection well. Waste salt water from field production will be injected directly into the top of the 8 5/8" water string at the rate of 200 to 400 barrels per day. It has been found that water will flow into the producing zone from 1390' to 1770' by gravitation.

The approval was based on the following:

1. There are no subsurface fresh water-bearing formations at this location and the water is to be injected into the producing zone at or below the oil-water interface.

2. Similar water injection wells have been in operation for more than three years in various parts of the field and there has been no evidence of detrimental effects.

You will note that after injection is commenced in this well, injection operations will be discontinued at well No. "Morganti" 3, Sec. 13, T. 9 N., R. 35 W., and that well will then be placed on production as an oil well.

Cecil L Barton

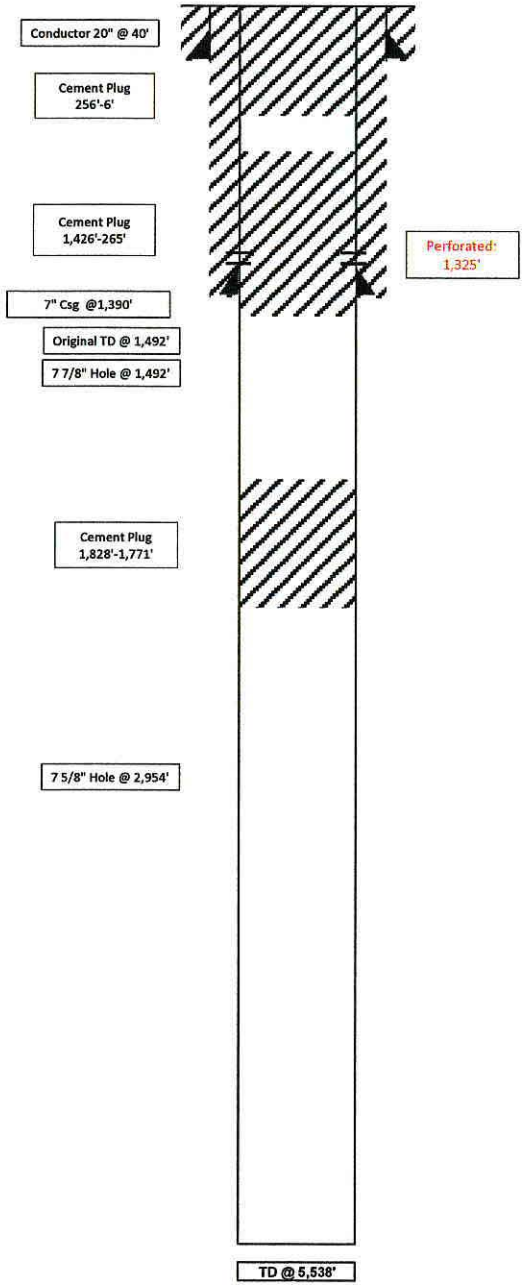
CECIL L BARTON
Deputy Supervisor

CLB/ms
Encl

26

WESCO MORGANTI 1

Casmalia Field



OPERATOR:	C. A. Maino
WELL:	Wesco-Morganti 1
COUNTY:	Santa Barbara
API # :	08300911
FIELD:	Casmalia
DISTRICT:	3
LEASE:	Wesco-Morganti
Latitude	34.857968
Longitude	-120.529046
Present Status	Abandoned: 11/10/1982

Section	Township	Range	Meridian	Elev. GL	Elev. KB
14	9N	35W	SB	446	456.8

Drilling and Completion Dates

Spud	Drill TD	Re-drill Date	Re-drill TD	Re-Drill 2
7/26/1955	1,492	9/1/1955	5,538	

Casing

Hole Dia (")	Size(")	Weight (lbs/Ft)	Grade	Top (ft)	Bottom (ft)
20	20		Conductor	surf	40
12 1/4	8 5/8	28#	H-40	surf	1,390
7 7/8	None			1,492	2,954
7 5/8	None			2,954	5,538

Cement Data

Hole Size	Number of Sacks or Cubic Feet of Cement	Depth of Cement if through perf	Comments
20			Conductor
12 1/4	340 Sacks / 200 Cubic Feet		Cemented csg @1390' w/135 sxs perm type C premixed w/200 cf panacrete and 5 sxs gel followed by 100 sxs type C treated w/2% CaCl2 (w/20' running cmt. Plug 1390'-1410'), set up squeeze tool @ 1315' and pumped in 50 sxs type C w/2% CaCl2, mixed and pumped in addititional 50 sxs type C
7 7/8	None		
7 5/8	None		

Perforations

Top of Perf	Bottom Depth	Date	Comments
1,325	1,325	7/31/1955	Four 1/4" holes @ 1,325'

Cement Plugs/ WSO

Depth	Sacks of Cement	Comments
265-6	8 linear yards plug	
1,426-265	15 yards 8 sack sand slurry	Tag w/tbg @ 265
1,828-1,771	45 sacks treated w/2% CaCl2	Fnd. top of hd. cmt. @ 1,730

Geological Markers

Formation	Measured Depth
Miocene	708

Well History

Well spudded 7/26/1955. Drilled to 1,492', did not produce. Re-drilled to 5,538' on 10/1/1955, did not produce. Converted to water injection well in 6/19/1957 so that water injection into Morganti 3 could be discontinued, thus freeing the well to be placed on production as an oil well. No data exists of rates of water injection, however the Report on Proposed Operations states "The proposed work is as follows: Inject 200 - 400 bbls. salt water per day produced from other wells.....". Well abandoned 11/10/1982.

Well Bore Diagram Created by Numeric Solutions LLC: 9/7/2012

Numeric Solutions LLC